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CLAIMS

What is claimed is:

1. An isolated, enriched, or purified nucleic acid molecule encoding a novel mCLK2, mCLK3, or mCLK4 polypeptide.
2. The nucleic acid molecule of claim 1, wherein said nucleic acid molecule is isolated, enriched, or purified from a mammal.
3. The nucleic acid molecule of claim 1, wherein said molecule encodes at least seventeen contiguous amino acids of the mCLK2, mCLK3, or mCLK4 amino acid sequence.
4. A nucleic acid probe for the detection of a nucleic acid molecule encoding a mCLK2, mCLK3, or mCLK4 polypeptide in a sample.
5. A nucleic acid vector comprising a nucleic acid molecule encoding a mCLK2, mCLK3, or mCLK4 polypeptide and a promoter effective to initiate transcription in a recombinant cell.
6. A recombinant cell or tissue comprising a nucleic acid molecule encoding a mCLK2, mCLK3, or mCLK4 polypeptide.

7. An isolated, enriched or purified mCLK2, mCLK3, or mCLK4 polypeptide.
8. The isolated, enriched, or purified mCLK2, mCLK3, or mCLK4 polypeptide, wherein said polypeptide is a unique fragment comprising at least seventeen contiguous amino acids present in the full-length amino acid sequence set forth in Figure 1, Figure 2, Figure 4, or Figure 6.
9. An antibody or a antibody fragment having specific binding affinity to a mCLK2, mCLK3, or mCLK4 polypeptide.
10. A hybridoma which produces an antibody having specific binding affinity to a mCLK2, mCLK3, or mCLK4 polypeptide.
11. An isolated, enriched, or purified nucleic acid molecule comprising a nucleotide sequence that:
  - (a) encodes a full-length mCLK2, mCLK3, or mCLK4 amino acid sequence as set forth in Figure 1, Figure 2, Figure 4, or Figure 6.
  - (b) the complement of the nucleotide sequence of (a);
  - (c) hybridizes under highly stringent conditions to the nucleic acid molecule of (a) and encodes a naturally occurring mCLK2, mCLK3, or mCLK4 protein;

- (d) a mCLK2, mCLK3, or mCLK4 protein having the full length amino acid sequence as set forth in Figure 1, Figure 2, Figure 4, or Figure 6 except that it lacks one or more of the following segments of amino acid residues 1-182, 183-470, or 471-499 of mCLK2, 1-176, 177-473, or 474-496 of mCLK3, or 1-183, 184-486, or 486-489 of mCLK4;
- (e) the complement of the nucleotide sequence of (d);
- (f) a polypeptide having the amino acid sequence set forth in Figure 1, Figure 2, Figure 4, or Figure 6 from amino acid residues 1-182, 183-470, or 471-499 of mCLK2, 1-176, 177-473, or 474-496 of mCLK3, or 1-183, 184-486, or 486-489 of mCLK4;
- (g) the complement of the nucleotide sequence of (f);
- (h) encodes a polypeptide having the full length amino acid sequence set forth in Figure 1, Figure 2, Figure 4, or Figure 6 except that it lacks one or more of the domains selected from the group consisting of a N-terminal domain, a catalytic domain, and a C terminal-region; or
- (i) the complement of the nucleotide sequence of (h).

12. A nucleic acid vector comprising a nucleic acid molecule of claim 11.

13. A recombinant cell or tissue comprising a nucleic acid molecule of claim 11.

14. A method of identifying a compound capable activating or inhibiting CLK protein kinase phosphorylation activity, wherein said method comprises the following steps:

- (a) adding a compound to a mixture containing a CLK protein kinase polypeptide and a substrate for said CLK protein kinase; and
- (b) detecting a change in phosphorylation of said substrate.

15. A method of identifying compounds useful for diagnosis or treatment of an abnormal condition in an organism, wherein said abnormal condition is associated with an aberration in a signal transduction pathway characterized by an interaction between a CLK protein kinase polypeptide and a natural binding partner, comprising the following steps:

- (a) adding a compound to cells; and
- (b) detecting whether the compound promotes or disrupts said interaction between a CLK protein kinase polypeptide and a natural binding partner.

16. A method of diagnosing an abnormal condition associated with cell proliferation or RNA splicing in an organism, wherein said abnormal condition is associated with an aberration in a signal transduction pathway characterized by an interaction between a CLK protein kinase polypeptide and a natural binding partner, comprising the step of detecting said abnormal interaction.

17. The method of any one of claims 14-16, wherein said CLK protein kinase is isolated from a mammal.

18. The method of any one of claims 15-16, wherein said organism is a mammal.